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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Bruno Christensen

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EXAMINER

DIAZ, THOMAS C

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/590,511	Applicant(s) CHRISTENSEN ET AL.	
	Examiner THOMAS DIAZ	Art Unit 3656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07/08/2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

The allowability of claim 6 has been withdrawn. A rejection of claim 6 is hereby submitted.

Claim Objections

Claims 2 and 5 are objected to because of the following informalities: Claim 2 recites "a second plate member)". The ")", open parenthesis sign is inappropriate and should be deleted. Claim 5 recites "the end of the shaft member or an extension there of". Since the shaft member was introduced in claim 3 and claim 5 depends on claim 2 then the word "the" before shaft member should be "a".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morishima et al. (USP 6240797) in view of Schindel (USP 3693759) and further in view of Dubiel (USP 4513827).

Regarding claim 1,

Morishima et al. discloses a linear actuator (fig.1 in Morishima et al.) comprising:

- A cabinet (fig.1, 3) having
- A reversible electric motor (fig. 1, 11) with a motor shaft (fig.1, 11a),
- A reduction gear (fig.1, 9, 10 and 12), where a first stage (fig.1, 12) with an input side is connected with the motor shaft,
- A spindle (fig.1, 5) whose one end is connected with an output side on the last stage of in the reduction gear (fig.1, 9) and the other end indicates the front of the actuator,
- A spindle nut (fig.1, 13) secured against rotation on the spindle such that this is moved to and fro on the spindle in response to the current direction of rotation of the motor (col.5, lines 50-59), and wherein the spindle nut [may be secured indirectly or directly to the structure in which the actuator is incorporated] (MPEP 2114; the nut is capable of being secured to the structure in which the actuator is being incorporated),
- A rear mount (fig.1, mount at the end of the shaft with the gearing)
- An ball and ratchet overload clutch (fig.1, 8).

Morishima et al. fails to disclose said first stage comprising a planetary gear and an extended end of the motor shaft is configured as a sun wheel having an orbital wheel and that wherein the overload clutch is arranged directly connected to the first stage in the reduction gear.

Schindel teaches the use of a planetary gear (fig.1, 72, 120 and 124) and an extended end of a motor shaft (fig.1, shaft to which 124 is connected) is configured as a sun wheel (fig.1, 124) having an orbital wheel (fig.1, 120) for the predictable and well-known purpose of providing a desired gear reduction drive between the motor shaft and a driven wheel. In actuators it is often desirable to have gear reduction in order to control the amount of torque or gear ratio needed or generated for a given application in which the actuator is to be used. Accordingly it is known to place planetary gearing at various locations in the drive train.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the gear train used by Morishima et al. to make use of a planetary gear (fig.1, 72), as taught by Schindel, for the predictable and well-known purpose of providing a desired gear reduction drive between the motor shaft and a driven wheel. In actuators it is often desirable to have gear reduction in order to control the amount of torque or gear ratio needed or generated for a given application in which the actuator is to be used. Accordingly it is known to place planetary gearing at various locations in the drive train.

Dubiel discloses the use of a ball and ratchet overload clutch (fig.2, 39, 40, etc) in direction connection with a planetary gear assembly (fig.2, 45, 46) for the purpose of providing a means to control torque overload in a machine.

It would have been obvious to modify the actuator as disclosed by the combination of Morishima et al. in view of Schindel by rearranging the ball and ratchet clutch 8 of Morishima et al. to be in direct connection with the planetary gearing, for the

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predictable result controlling of torque overload in the system. The location of the clutch can easily be changed as long as it is somewhere in the gear train. Dubiel provides a teaching of how a similar clutch can be connected to a planetary gear assembly.

Regarding claim 7,

Morishima et al. discloses a guide profile (fig.1, housing of the actuator which covers cabinet 3) is attached to end of the cabinet. Currently, Morishima et al. shows in fig.1 what appears to be a single claw connecting the housing to cabinet 3.

Morishima et al. fails to explicitly disclose the guide profile is attached to the cabinet with two claws which grip the outside of the guide profile. However it would have been obvious to one having ordinary skill in the art to modify the guide profile disclosed by Morishima et al. to comprise two separate claws which grip the cabinet as a matter of design choice. Both a single or two claws would perform the same function of fastening the housing together.

Claims 2-4, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morishima et al. (USP 6240797) in view of Schindel (USP 3693759) and further in view of Dubiel (USP 4513827), as applied to claim 1, and further in view of Alfano (USP 6259175).

Regarding claim 2,

Morishima et al. is silent to the specific structure of the clutch assembly.

Alfano et al. teaches a linear actuator having a similar clutch system (fig.9) to the applicant's claimed invention for the purpose of limiting the amount of torque that can be transmitted from the motor to the screw assembly (see abstract) comprising:

- a ring with holes (fig.9, 83, The gear has hole for the balls and the clutch plates.)
- a first plate (fig.9, 85) with depressions (fig.9, 85a) that engage the balls (fig.9, 87) and is firmly connected to the transmission from the motor (fig.9, the gear 83 is connected to the transmission of the motor),
- a second plate with depressions that engage another side of the balls (fig.9, 86 and 86a),
- a spring mounted against the ceiling in a cap (fig.9, springs 90-92 mounted against the ceiling of a cap 94. Examiner takes the position that retaining ring 94 acts as a cap on the spring because it covers it.),
- wherein the cap is secured indirectly to the first plate member (seen in fig.9, the cap is secured to the first plate member the other members of the clutch assembly), and

wherein the ring with the balls is connected with the further transmission to the spindle (fig.9, gear 83 being part of the transmission and a spindle (fig.9, 81) is connected to the gear 83.) for the purpose of providing a torque limiting device to control the amount of torque transmitted to the driven shaft.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to replace the clutch assembly disclosed by Morishima et al. with the

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clutch assembly taught by Alfano for the purpose of providing improved torque limiting device to control the amount of torque transmitted to the driven shaft.

Regarding claim 3,

Morishima et al. discloses the clutch being connected to a shaft member (fig.1, shaft of 10; it is not required to be a direct connection) with a gear wheel (fig.1, 10) as a transition to subsequent stages in the gearing in the spindle.

Regarding claim 4,

Morishima et al. discloses a shaft member being connected with a brake device (fig.1, 6 and 7 is a one way brake. The shaft member is connected through gearing 9 and spindle 5 to the brake device. A direct connection is not required).

Regarding claim 8,

Applicant claims an electrical control for the actuator incorporated inside the cabinet which Morishima et al. fails to teach.

Alfano et al. teaches that printed circuits are included within the housing for the actuator for the purpose of electrical devices such as limit switches used to generate electric signals when the actuator has extended or retracted a certain amount (col.7, lines 26-36).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to add the printed circuits taught by Alfano et al. with the actuator of Morishima et al. for further control the extent of movement of the actuator electronically.

Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morishima et al. (USP 6240797) in view of Schindel (USP 3693759) and further in view of Dubiel (USP 4513827), and further in view of Alfano (USP 6259175), as applied to claim 2 above, and further in view of Akkerman (US patent 5195721).

Applicant claims that the end of a shaft member or an extension thereof is configured to receive a crank through an opening in the cabinet for manual operation of the actuator.

Morishima et al. fails to teach an actuator configured to be manually operated with a crank.

Akkerman teaches a valve actuator configured with an opening in the housing for a crank (fig.1, 130) in order to provide a way to manually operate the actuator in case the electric motor fails (col. 5, lines 66+, col. 6 lines 1-2).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the manual operation mechanism taught by Akkerman with the actuator taught by Whittingham in order to provide a back-up mechanism for operating the actuator in case of motor failure.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morishima et al. (USP 6240797) in view of Schindel (USP 3693759) and further in view of Dubiel (USP 4513827), as applied to claim 1, and further in view of Ochtman (USP 2465601).

Morishima et al. discloses a rear mount (fig.1, 2) and a bearing for the spindle (fig.1, end of spindle which is within the mount forms a bearing).

Morishima et al. fails to disclose a the rear mount and the bearing are secured in a mounting element consisting of two parts mounted in a depression in the cabinet and secured with a nut screwed on to the part of the rear mount which protrudes through the cabinet.

Ochtman teaches the use of a rear mount (fig.1, 12) and a bearing (fig.1, 40) secured in a mounting element consisting of two parts (fig.1, 34 and the part surrounding the bearings) mounted in a depression in the cabinet and secured with a nut (fig.1, 36) screwed on to the part of the rear mount which protrudes through the cabinet for the purpose of providing a secure connection to an external device to which the actuator is being mounted.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the rear mount and bearing assembly disclosed by Morishima et al. to include the rear mount, bearing and mounting element as taught by Ochtman for the purpose of providing a secure connection to an external device to which the actuator is being mounted. There are various ways of constructing the mounting element and rear mounts in these types of actuators and they all solve the same problem.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morishima et al. (USP 6240797) in view of Schindel (USP 3693759) and further in view of Dubiel (USP 4513827), as applied to claims 1 and 7, and further in view of Abraham (US patent 4712441).

Regarding claim 9, Applicant claims two electrical switches for controlling the end stop positions of the spindle nut, which are activated by a longitudinally movable element with two arms seated in a slot in a housing, said arms having a spring interposed between them whose ends engage a stop in the housing.

Morishima et al. fails to disclose the switches along with the structure connecting them.

Abraham discloses a linear actuator with a limit switch assembly that has two electrical switches (fig.8 and fig. 9, 210 and 212) which are operated by the shaft (fig.9, 54) which is connected to two arms (fig. 8, 166 and 208, Examiner takes the position that the cams can be considered arms because they can move and they operate the limit switches (col.7, lines 66+ and col.8, line 1)). These arms are seated in a housing (fig.8, 36) and have a spring (fig. 5, 158) interposed between them whose ends engage a stop or push button (fig.5 and fig. 8, 150) which disengages the drive gear if depressed (col. 7, lines 40-44). The limit switch assembly which contains these components is used for controlling the power input to the drive motor (col. 8, lines 1-4).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine switches or limit switch assembly taught by Abraham with the linear actuator taught by Morishima et al. in order to provide a linear actuator with better power control and therefore better position control.

Regarding claim 10, Applicant claims a potentiometer constructed as an add-on unit in engagement with down gearing between a clutch and the spindle.

The combination made above fail to disclose this potentiometer.

Abraham teaches the use of a potentiometer (fig. 5, 190) for the purpose indicating the position of the drive nut (col.8, lines 39-43). The potentiometer is connected to the reduction gearing (fig. 5, 198).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the potentiometer taught by Abraham with the actuator disclosed by Morishima et al. in order to provide an electrical signal with the drive nut position to the circuits or control devices being used in controlling the position of the actuator. Furthermore, it would be obvious to provide this potentiometer between a clutch and a spindle since it is connected to the reduction gearing which is already disposed between these components.

Response to Arguments

Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS DIAZ whose telephone number is (571)270-5461. The examiner can normally be reached on Monday-Friday 8:30am to 5:00pm..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571)272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas Diaz/
Examiner, Art Unit 3656

/Richard WL Ridley/
Supervisory Patent Examiner, Art Unit 3656